



# FINAL 2008 INTEGRITY AND HYDROSTATIC TESTING REPORT (CDRL A001) OF JP-8 AND GROUND FUELS PIPING

at

KIRTLAND AFB, NM



Prepared for:

**Defense Energy Support Center Ft. Belvoir, Virginia** 

Prepared under:

AFCEE Contract FA8903-04-D-8684-0011

Submitted by:

Michael Baker Jr., Inc. Virginia Beach, VA

Date: 8 December 2008



# FINAL 2008 BIENNIAL INTEGRITY AND FIVE YEAR HYDROSTATIC TESTING REPORT (CDRL A001) OF THE PETROLEUM OIL AND LUBRICANT (POL) FUEL PIPELINES

AT

#### KIRTLAND AFB, ALBUQUERQUE, NEW MEXICO

#### Prepared for:

#### Defense Energy Support Center Ft. Belvoir, VA

Prepared under:

AFCEE Contract FA8903-04-D-8684-0011 Project Number: ENV-08-2

Prepared by:

Michael Baker Jr., Inc. Virginia Beach, Virginia

**08 December 2008** 

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APPENDIX A: Hansa Consult North America Test Report

PROFESSIONAL ENGINEER CERTIFICATION:

FINAL 2008 BIENNIAL INTEGRITY TESTING REPORT (CDRL A001) AND

THE FIVE YEAR HYDROSTATIC TEST OF THE PETROLEUM OIL AND

**LUBRICANT (POL) FUEL PIPELINES** 

AT

KIRTLAND AFB, ALBUQUERQUE, NEW MEXICO

This report has been reviewed by a professional engineer and has been prepared in

accordance with good engineering practices. Laboratory results, field notes, and

supporting data have been reviewed and referenced correctly.

I hereby certify that I have examined this report and attest that it has been prepared in

accordance with good engineering practices.

Engineer: Christopher D. Caputi, P.E.

Registration Number: 032382

State: Virginia

Date: 08 December 2008

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#### **EXECUTIVE SUMMARY**

This was the initial integrity testing and five year hydrostatic testing performed at Kirtland AFB under the centralized Defense Energy Supply Center environmental contract. The testing was performed because of an agreement between Kirtland AFB and New Mexico Department of Environmental Quality. All the underground piping located at the Bulk Storage Fuel Yard was both integrity and hydrostatically tested. This included the JP-8 piping between the pump house and aboveground storage tanks 22 and 23 out to fill stands 1 and 2. The underground piping associated to the ground fuel (Mogas, Diesel and Biodiesel) fill stand was also tested. All the piping was tested with no detectable leak rate above the test method's minimum detectable leak rate of 0.002% of line volume and pressure tested to one and half times operating pressure with no significant pressure loss.

The JP-8 fueling system and ground fuel system(s) at Kirtland AFB *passed* integrity testing and pressure testing.

Kirtland AFB should continue to operate the JP-8 fueling system and ground fuel system(s) in accordance with all Federal, State, and local regulations. The JP-8 fueling system and ground fuel system(s) should receive integrity testing at a minimum of every two years therefore the retest should occur on or before the biennial anniversary date of November 2010.

#### 1.0 INTRODUCTION

#### 1.1 Purpose of Project

The Defense Energy Support Center contracted Michael Baker Jr., Inc. (Baker) through AFCEE Contract FA8903-04-D-8684-0008, Project Number ENV-08-2 to perform biennial integrity testing and five year hydrostatic testing of POL fuel pipelines at Kirtland AFB, NM.

The purpose for the integrity testing was an agreement between Kirtland AFB and New Mexico Department of Environmental Quality. The purpose for the five year hydrostatic test was to satisfy the Air Force's Unified Facilities Criteria (UFC) 3-460-03 Chapter 2 Section 2.3.3.2

#### 1.2 Project Scope

The scope of this project is to perform biennial integrity testing and the five year hydrostatic testing on the POL fuel piping at Kirtland AFB on 3 -11 November 2008.

Table 1 – Sections Tested

SECTION	B	PIPELINE	PIPELINE			PIPELIN	E <b>L</b> ENG1	LENGTH [ft]			TOTAL
No.	Designation	MATERIAL	<b>S</b> CHEDULE	4"	6"	8"	10"	12"	16"	24"	LENGTH [ft]
1	Bio Diesel Truck Line	cs	STD.	80							80
2	Tank 22 & 23 16" Lines with Pumphouse	cs	STD.		80		200		2,479	120	2,879
3	Fillstand 1 & 2 Lines to Pumphouse Filters	CS	STD	100		885					985
4	Low- Sulfur Diesel Truck Line	CS	STD	80							80
5	MOGAS Truck Line	cs	STD.	80							80
Legend: SS: Stainle CS: Carbon STD: Stand											
	TOTAL:			340	80	885	200	0	2,479	120	4,104

#### 1.3 Project Team

Baker subcontracted Hansa Consult North America (HCNA) to perform the integrity testing. Field-testing oversight, coordination with facility fuels representatives, quality assurance/quality control (QA/QC), and final report preparation and submission was provided by Baker personnel.

#### 1.4 Qualifications of Testing Procedures Used

There were two testing procedures used, HCNA leak detection method and the static stress pressure test. Determination of leakage is based on the criteria established in the Ken Wilcox Associates third party evaluation. For further detail of HCNA's test methodology see Hansa Consult of North America's test report Appendix A section 4. The five year pressure test was performed by an equivalent pipeline assessment which was to take the piping up to one and half times operating pressure and hold it for a four hour period while monitoring the pressure. This method in combination with the integrity step pressure test is described has an acceptable alternative under UFC 3-460-03, CH 2, Section 2.3.3.2.

#### 2.0 TESTING AND RESULTS

Hansa Consult North America test report is provided in Appendix A. The JP-8 fueling system and the ground fuels piping was integrity tested and pressure tested on 3 - 11 November 2008 with *no detectable leak/a detectable leak* above the test method's minimum detectable leak rate of 0.002% of pipeline volume and acceptable pressure test results.

**Table 2 – Test Results** 

Section No.	Designation	Section Volume [gal]	Certified MLDR [gal/h]	Recorded MLDR [gal/h]	TEST DATE	TEST RESULT
1	Bio Diesel Truck Line	53	0.10	0.01	11/05/2008	PASS
2	Tank 22 & 23 16" Lines with Pumphouse	27,108	0.54	0.30	11/04/2008	PASS
3	Fillstand 1 & 2 Lines to Pumphouse Filters	2,366	0.10	0.01	11/04/2008	PASS
4	Low- Sulfur Diesel Truck Line	53	0.10	0.05	11/05/2008	PASS
5	MOGAS Truck Line	53	0.10	0.07	11/05/2008	PASS

Table 2: HCNA LDS Tightness Test Results

SECTION No.	DESIGNATION	Section Volume [gal]	Test Date	Test Result
1	Bio Diesel Truck Line	53	11/06/2008	Within Leak Threshold
2	Tank 22 & 23 16" Lines with Pumphouse	27,108	11/10/2008	Within Leak Threshold
3	Fillstand 1 & 2 Lines to Pumphouse Filters	2,366	11/05/2008	Within Leak Threshold
4	Low- Sulfur Diesel Truck Line	53	11/05/2008	Within Leak Threshold
5	MOGAS Truck Line	53	11/06/2008	Within Leak Threshold

Table 3: HCNA Stress with Integrity Test Results

#### 3.0 CONCLUSIONS AND RECOMMENDATIONS

#### 3.1 Conclusions

The JP-8 fueling system and the ground fuels piping *passed* the initial integrity test and the five year hydrostatic test.

#### 3.2 Recommendations

Kirtland AFB underground piping system should continue to operate in accordance with all Federal, State, and local regulations. The JP-8 fuel and ground fuel system should be retested on or before the anniversary date of November 2010

# **APPENDIX A: Hansa Consult North America Test Report**

# **HCNA**Leak Detection System

# "Point in Time" Mobile Trailer Testing Test Report

### Perform Certified Pipeline Leak Detection Test at Kirtland AFB, New Mexico

Submitted To: Michael Baker Jr., Inc.

Delivery Order: 114623 8.7.9.33 Mod 1

**November 30, 2008** 



Submitted by: Hansa Consult of North America, LLC 200 International Drive, Bldg. 120 Portsmouth, N.H. 03801

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#### HCNA Mobile Trailer Pipeline Testing

Site: Kirtland AFB, New Mexico

**DESC Environmental Leak Detection Maintenance Program** 



#### HCNA Project 2008-250

#### Hansa Consult of North America, LLC

Kirtland AFB, New Mexico

30 November 2008

Prepared for:



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#### HCNA Mobile Trailer Pipeline Testing

Site: Kirtland AFB, New Mexico
DESC Environmental Leak Detection Maintenance Program



#### HCNA Project 2008-250

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# HCNA Mobile Trailer Pipeline Testing Site: Kirtland AFB, New Mexico DESC Environmental Leak Detection Maintenance Program

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#### 1 INTRODUCTION

Hansa Consult of North America, LLC (HCNA) has been tasked by Michael Baker Jr., (Baker) Inc. to perform mobile pipeline testing at Kirtland AFB, New Mexico. Testing is conducted under contract AFCEE WERC #FA8903-04-D-8684 and subsequent delivery order 114623 8.7.9.33 Mod 1. This delivery order provides for HCNA to conduct tightness testing and certification at Kirtland AFB, utilizing the third-party certified HCNA Leak Detection System Version 2.0. Additionally, this delivery order shall provide project management, and engineering services to conduct a Pipeline Integrity Assessment, the objective of which is to assess the integrity and tightness of Petroleum, Oil and Lubricants (POL) fuel pipelines located at Kirtland AFB, New Mexico. HCNA shall conduct the equivalent assessment of a five year pressure test as required by DOD UFC 3-460-03. Prior to initiating the testing program, it was agreed by Baker and Kirtland AFB that HCNA should conduct the scheduled pipeline assessment in accordance with UFC 3-460-03, CH 2, Section 2.3.3.2.

The final testing and certification for Kirtland AFB, New Mexico was conducted between November 3-7, 10,11, 2008, with successful results. A detailed trip report for the activities conducted during this period is provided in Appendix B.

#### 1.1 Purpose of Inspection

The purpose of the November 2008 testing and certification was to perform testing on Defense Energy Support Center (DESC-) owned and operated DoD pipeline fueling installation. The testing satisfies the requirement of the applicable Federal pipeline leak detection and provides requisite compliance for the test location. Testing and subsequent certification were performed utilizing a third-party certified HCNA Leak Detection System Version 2.0 -- specifically, the HCNA mobile leak detection trailer. The HCNA mobile testing method provides important flexibility by including all equipment within a single trailer to enable efficient testing in multiple locations while giving site representatives, Michael Baker Jr., Inc., and DESC real time test results. HCNA's testing method also provides for limited operational impact, enabling Kirtland AFB, New Mexico to continue to operate the system during testing.

As the ultimate owner and operator of this pipeline system DESC determined the federal requirement that provides for systematic leak detection of underground fuel systems, which includes the subject piping at Kirtland AFB, New Mexico. The subject pipeline falls under UFC 3-460-03, CH 2, Section 2.3.3.2, which has a five year test requirement. The subject line was tested IAW this requirement. Finally, the Hansa Consult of North America Leak Detection testing:

- Was preformed to assist with establishing the pressure carrying integrity of the pipeline (strength test), and therefore the Maximum Allowable Operating Pressure (MAOP);
- This procedure seeks to maximize the value of the pressure test to the pipeline operator by
  providing a documented and improved level of certainty with respect to test segment line
  integrity as well as establish the line tightness to the maximum practical extent third-party
  leak test of each test segment line, and
- Provided regulatory authorities a measure of confidence in the pipeline's ability to continuously and safely operate up to certain maximum internal pressures while satisfying state regulations, and
- Sought to maximize the value of the pressure test to the pipeline local operator by providing a documented and improved level of certainty with respect to the integrity of each test segment line.

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#### 1.2 <u>Regulatory Requirements</u>

As the ultimate owner and operator of this pipeline system DESC determined the federal requirement that provides for systematic leak detection of underground fuel systems, which includes the subject piping at Kirtland AFB, New Mexico.

#### 2 SITE AND EQUIPMENT DESCRIPTION

#### 2.1 <u>Test Procedures</u>

The Hansa Consult of North America Leak Detection System test was utilized to perform real time pressure measurement for detecting leaks in underground pipelines accurately and quickly proving the tightness of any pressurized liquid filled pipeline system. This testing system, which is based on the Pressure Step method, meets or exceeds the highest national and international standards. The HCNA Pressure Step methodologies employed at Kirtland AFB provide a precise and accurate 45-minute test. Test section results were recorded, assessed, and certified by HCNA in accordance with U.S. EPA guidelines. HCNA provided integrity tightness testing of a pressurized single-wall underground fuel pipeline at Kirtland AFB (see Table 1 for details). All test sections pipe dimensions and volumes were reviewed and confirmed with Kirtland AFB, New Mexico personnel as well as HCNA staff during testing and certification.

Pipeline assessment services were conducted based on the referenced requirements utilizing the HCNA Pressure Step leak detection method in conjunction with a pressure measurement and monitoring program. This program was coordinated and approved in advance by Baker, Kirtland AFB CES, and previously approved by the HQ AMC Fuels Engineer. The test pressure was a minimum of 150% of the operating pressure for a four (4) hour stress/integrity test, which was inconjunction with a 45 minute HCNA Pressure Step leak test. Test pressures were agreed upon in advance of testing as previously stated. Pressure results for the stress/integrity test were recorded continuously with results plotted and assessed on 15 minute intervals for the duration of the test. HCNA leak test results were certified in accordance with HCNA US EPA Third Party Certifications. HCNA provided integrity tightness testing of a pressurized single-wall underground transfer pipeline at Kirtland AFB, New Mexico (see Table 1 for details). All test sections pipe dimensions and volumes were reviewed and confirmed with Kirtland AFB, New Mexico personnel as well as HCNA staff during testing. A general description of the piping layout is provided in section 2.4.

#### 2.2 Test Sections

The test segment number and associated pipeline description for the five (5) test sections performed were as follows:

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SECTION	_	PIPELINE	PIPELINE			PIPELIN	PIPELINE LENGTH [ft]			TOTAL	
No.	Designation	MATERIAL		4"	6"	8"	10"	12"	16"	24"	LENGTH [ft]
1	Bio Diesel Truck Line	cs	STD.	80							80
2	Tank 22 & 23 16" Lines with Pumphouse	CS	STD.		80		200		2,479	120	2,879
3	Fillstand 1 & 2 Lines to Pumphouse Filters	CS	STD	100		885					985
4	Low- Sulfur Diesel Truck Line	CS	STD	80							80
5	MOGAS Truck Line	cs	STD.	80							80
Legend: SS: Stainle CS: Carbor STD: Stand											
_	TOTAL:			340	80	885	200	0	2,479	120	4,104

Table 1: Test Sections

#### 2.3 Test Fluid Specifications

Integrity testing was conducted using JP-8 as the test medium for bulk tanks and truck fillstand pipelines at Kirtland AFB, New Mexico. Additionally, ground product pipelines were tested utilizing the respective test mediums, which included Bio-Diesel, Low-Sulfur, and MOGAS. These test mediums were also utilized to conduct the stress/integrity testing; as confirmed with Kirtland AFB, New Mexico personnel, typical HCNA 145 psig high pressure tests cycle criterion was used for each test section.

#### 2.4 Description of Facility

The approximate four thousand one hundred four (4,104) feet of tested underground pipeline at Kirtland AFB, comprises five (5) test sections. All test sections are located within the fuel storage area. The test sections components are the Bulk Tank and pumphouse piping as well as the truck fillstand piping and ground products pipelines. The Bulk Storage Tanks, 22&23 piping are bidirectional common pipeline that exit the respective tank and travel north / northwest terminating at the pumphouse facility. The truck fillstand piping exits the pumphouse facility, travels south then turn east towards both Fillstand 1 & 2. Each of the ground products pipelines have an above ground storage tank (AST) located northwest of the ground products pumphouse facility. This pipeline is aboveground from the AST to the pumphouse. Each of the pipelines exit the pumphouse facility and turn underground traveling southwest terminated at the truck rack.

For purposes of integrity testing, the Kirtland AFB pipeline system was delineated into five (5) test sections (see Table 1).

The length of the pipeline was calculated from provided documents as well as on-site personnel knowledge. The piping diameter for the entire piping system ranges from 4" to 24" dependent upon test section.

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#### 2.5 Set-up and Testing

The test set-up, execution and dismantling were conducted November 1-7, 10-11 2008 (specifically, October 3-7 & 11, 2008). The following detailed procedures were used in testing each pipeline section. Sections are illustrated in the configuration drawings provided in Appendix D:

- Section 1: Bio Diesel Truck Line
  - Closed valve located within the ground products pumphouse facility. (Please refer to Appendix A, Figure 11).
  - o Installed temporary "skillet" to properly isolated test section. (Please refer to Appendix A, Figure 12).
  - o For the actual testing and assessment of the pipe section, a temporary "test connection" was connected at the truck rack. The connection was made at the pressure relief connection with a ½" ball valve. HCNA installed a temporary fitting and the HCNA pressure transmitter, portable hand pump as well as the trailer hose connection was established from this location with a hose adapter. (Please refer to Appendix A, Figure(s) 13-14).
- Section 2: Tank 22 & 23 16" Lines with Pumphouse
  - Confirmed valves were closed at Tank 22 & 23. (Please refer to Appendix A, Figure(s) 15-18).
  - Properly configured all required valves located at the pumphouse facility to enable testing of pipelines. (Please refer to Appendix A, Figure(s) 19-24).
  - For the actual testing and assessment of the pipe section, the connection was made at the low-point with a 2" ball valve. HCNA trailer hose connection was established with an aluminum 2" dry break adapter. (Please refer to Appendix A, Figure(s) 25-26).
- Section 3: Fillstand 1 & 2 Lines to Pumphouse Filters
  - Properly configured all required valves located at the pumphouse facility to enable testing of pipelines.
  - Properly configured all required valves located at Fillstands 1&2. (Please refer to Appendix A, Figure(s) 27-28).
  - o For the actual testing and assessment of the pipe section, the connection was made at a pressure relief located at fillstand 2" utilizing a ¾" ball valve. HCNA trailer hose connection was established with a ¾" connection and an aluminum 2" dry break adapter. (Please refer to Appendix A, Figure(s) 29-30).

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- Section 4: Low- Sulfur Diesel Truck Line
  - Closed valve located within the ground products pumphouse facility. (Please refer to Appendix A, Figure 31).
  - o Installed temporary "skillet" to properly isolated test section. (Please refer to Appendix A, Figure 32).
  - o For the actual testing and assessment of the pipe section, a temporary "test connection" was connected at the truck rack. The connection was made at the pressure relief connection with a ½" ball valve. HCNA installed a temporary fitting and the HCNA pressure transmitter, portable hand pump as well as the trailer hose connection was established from this location with a hose adapter. (Please refer to Appendix A, Figure 33).
- Section 5: MOGAS Truck Line
  - Closed valve located within the ground products pumphouse facility. (Please refer to Appendix A, Figure 34).
  - o Installed temporary "skillet" to properly isolated test section. (Please refer to Appendix A, Figure 35).
  - o For the actual testing and assessment of the pipe section, a temporary "test connection" was connected at the truck rack. The connection was made at the pressure relief connection with a ½" ball valve. HCNA installed a temporary fitting and the HCNA pressure transmitter, portable hand pump as well as the trailer hose connection was established from this location with a hose adapter. (Please refer to Appendix A, Figure 36).
- After each HCNA Leak Detection System test, a hardcopy of the test report was produced, indicating the test result and the specific test data (one page per section tested). Copies of the Test Reports are provided in Appendix C. These incorruptible test reports have been archived for future reference (e.g., requests from authorities). The reports provide evidence of the tightness of the system, which is critical to complying with regulations. No HCNA test results can be deleted or altered without deleting the entire database. The Hansa Consult of North America computer stores all relevant data and results. An example of a test report is included below in Figure 1:



Figure 1: HCNA Leak Detection Test Report for Test Section Located at Kirtland AFB, New Mexico

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- All equipment required to conduct the HCNA Leak Detection System tightness test are mounted within the mobile trailer, (please refer to figure 2). This equipment includes: a jockey pump, connection hoses, pressure transmitter, data interface, the control and evaluation unit, laptop computer, as well as trailer mounted fuel holding tank for test segment pressurization/depressurization. All electrical components associated with the trailer skid are explosion-proof (Class I Div I) from the National Electrical Code (NEC), and the trailer is equipped with an onboard generator to provide power for all components. The trailer unit was independent from the local infrastructure during the tests. Fuel quality is guaranteed by the fact that all metal parts are made of stainless steel. (Please see Figures 3-6.)
- Using the pump provided in the trailer, the system was pressurized to approximately 145-psi, and the system was visually inspected for leaks. Once no drips, seeps, etc. were discovered during pressurization, a 45-minute HCNA Pressure Step leak test was performed. A test was conducted for each section, each with passing results. Accordingly, the valve configuration used for each can be assumed satisfactory; otherwise the system would not have held pressure during the test. Leak simulations were performed as part of the certification process to confirm the leak threshold and further substantiate the tightness factors established. (Please refer to Figure 7 below)
- Following the integrity test for each section, all pressure test equipment was dismantled and all fluid from hose connections was collected. Lastly, base personnel were notified at the completion of the test and insured all valves were returned to their original position prior to testing.
- Detailed test section specifications, results, and photographs are provided in Appendices A-E. The information is presented and delineated by test section.



Figure 2: Mobile Trailer



Figure 3: Mobile Trailer-Device Control Screen

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Figure 4: Mobile Trailer PLC



Figure 6: Test Connection Point "Typical"



Figure 5: Laptop Computer and Printer



Figure 7: Leak Simulation "Typical"

#### 3 SYSTEM CERTIFICATION

Hansa Consult of North America, LLC utilizing the HCNA mobile trailer unit, certified the underground fuel piping at Kirtland AFB, New Mexico. Certificate pages are provided in Appendix C.



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#### 4 HCNA PRESSURE STEP TEST METHODOLOGY

#### 4.1 Overview

The tightness testing of the pipeline can be determined by applying the HCNA Pressure-Step test methodology. The testing is conducted and a tightness factor is determined by the evaluation of the measurement results. The tightness factor is the leaking liquid volume in gallons per hour of the checked volume usually based on 145 psi (10 bar).

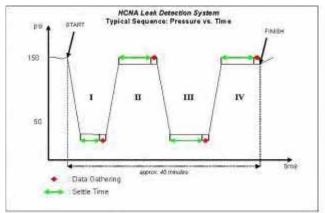


Figure 8: Hansa Consult of North America -LDS Normal Pressure-Step Test Sequence

The Hansa Consult of North America Pressure Step Test Sequence consists of five phases:

- **Phase I**: The pressure of the test section(s) system is lowered to a defined pressure level of typical 40 psi. Pressure data are gathered for a defined period after a pre-set settle-time has elapsed.
- **Phase II**: The pressure of the test section(s) is raised to the high-pressure test level. The high-pressure level is adjusted to a pressure level between 140 and 160 psi. The system is closed absolutely tight after having reached this pressure. The measured pressure values are recorded by the HCNA Pressure Step method for a defined period after a pre-set settle-time is elapsed.
- **Phase III:** The pressure in the fuel system is reduced to a low-pressure level via manual operation of the pertinent ball valve. The low-pressure level is usually adjusted to between 40-60 psi. The system is stabilized again. Then the HCNA Pressure-Step method records pressure values.
- Phase IV: For evaluation purposes the same procedure as in phase II is executed.
- Phase V: The computer evaluates the input test data, calculates a tightness factor and displays the condition of the fuel system. If the tightness factor is not higher than the upper tolerable limit, the condition of the system is indicated as PASSED. If the tightness factor is outside the tolerable limit, it is indicated accordingly.

The results of the test are printed out in a protocol for future reference. All data are stored in the HCNA computer. A Pressure Step tightness test with all five phases requires approximately 30-45 minutes depending on site-specific circumstances. At the conclusion of the testing activities, the fuel system can be returned to normal operations.



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#### 4.2 <u>Evaluation of Test Results</u>

The determination of a leak is most influenced by temperature and pressure changes during testing. The Pressure Step method is based on the physical fact that given a defined leak size the leak rate would be proportionately larger at higher pressure than at lower pressure. Because the leak rate is directly related to a change in pressure, it can be determined from the pressure gradients during the test, whether the system is or is not tight. The test results enable the HCNA Pressure-Step program to compare the pressure curves of the different pressure levels and to determine the tightness factor.

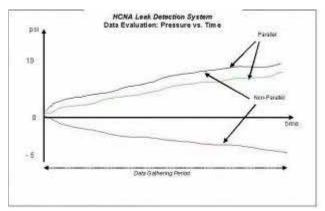


Figure 9: Pressure Curve

Assuming ideal conditions the curves would be horizontal and parallel. However, temperature and other external effects result in ascending or descending characteristics. If the system is not tight, the leak will be higher at the high-pressure test than at the low-pressure test. As a result the pressure curves would no longer run parallel.

It is important to note that despite the significant influence temperature change has on pressure – and therefore on the leak determination – the HCNA Leak Detection System method does not require temperature measurement or compensation. Any temperature influences are addressed by application of the pressure-step methodology itself.

Using the Pressure Step methodology, HCNA is able to determine the leak rate based on the specific properties of the material and geometry of the piping system being tested. The evaluated tightness factors are recorded in a statistical database. The reliability of HCNA's method can be verified at anytime through controlled, manually created leaks.

#### 4.3 Criteria for Classification of Tightness

The determination of tightness of the piping being tested is based upon the resultant tightness factor determined by the Pressure-Step Test.

Pass Criteria: Within Tolerable Limit. Fail Criteria: Exceeds Tolerable Limit.

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#### 5 RESULTS / CONCLUSIONS

#### 5.1 <u>Test Assessment Methods</u>

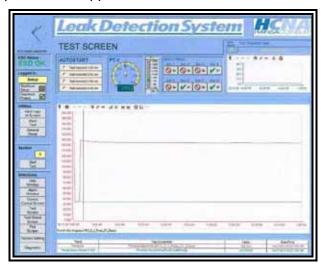
The pipeline test sections were assessed by one or more of the following methods:

#### 5.1.1 Visual Inspection

Any exposed pipe, fittings and other appurtenances were visually inspected for evidence of leakage. Additionally, each of the sections were travelled to confirm the overall directional run of the pipeline and provide inspection as required of valve pits, high and low points.

#### 5.1.2 Pressure Monitoring Plots

As stated above the recording of test data for four (4) hours at fifteen (15) minute intervals for the duration of the test. Examples of the monitoring plot are depicted below, Test Segment plots for the entire stressed event are provided in Appendix C.



"Typical" Pressure Monitoring Plot

#### 5.1.3 HCNA Pressure-Step Leak Detection Test

The underground fuel piping at Kirtland AFB, New Mexico was certified by HCNA utilizing the HCNA mobile trailer unit and employing the HCNA Pressure-Step test methodology.

In accordance with the above stated "Criteria for Classification of Tightness", all sections passed the tightness certification test. Certificate pages and leak test reports are provided in Appendix C. The HCNA Leak Detection System is a U.S. EPA Third-party-certified technology, which is capable of detecting a leak of 0.00015 gallons an hour per cubic foot at 145 psi. This equates to a certified capability to detect leaks of 0.002% of line volume at 145 psi with a detection probability of detection ( $P_D$ ) > 95% and probability of false alarm ( $P_{EA}$ ) < 5%.

#### 5.1.4 Test Results

The underground fuel piping at Kirtland AFB, New Mexico was certified by HCNA utilizing the HCNA mobile trailer unit as well as portable HCNA test equipment. There were two testing procedures used, System methodology and static stress/integrity test. Determination of leakage is based on the above stated EPA established criterion, which was approved and certified by a third-party evaluation. For further detail of HCNA's test methodology please refer to Section four (4) of this report or <a href="https://www.hcna-llc.com">www.hcna-llc.com</a>.

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The HCNA LDS Pressure Step method third-party leak detection testing was performed to quantify a leak rate for each test section. This method in combination with the equivalent of a "five year pressure test pipeline assessment" was performed. Each test section piping was "stressed", pressurized up to one and half times operating pressure. Once at desired pressure, the test section was monitoring for a four hour period. The 15-minute interval plotted test pressures and data reports for each test section are provided in Appendix C. This "stress with integrity" method as described is an acceptable alternative under UFC 3-460-03, CH 2, Section 2.3.3.2. Based on the integrity assessment in conjunction with an HCNA Leak Detection test, all tested section located at Kirtland AFB are within the allowable gallon per hour leak threshold and passes the criteria for acceptance. Additionally, in accordance with the above stated "Criteria for Classification of Tightness", each section passed the tightness certification test. Results are summarized below; Certificate pages and leak test reports are provided in Appendix C.

SECTION No.	DESIGNATION	Section Volume [gal]	CERTIFIED MLDR [gal/h]	RECORDED MLDR [gal/h]	TEST DATE	TEST RESULT
1	Bio Diesel Truck Line	53	0.10	0.01	11/05/2008	PASS
2	Tank 22 & 23 16" Lines with Pumphouse	27,108	0.54	0.30	11/04/2008	PASS
3	Fillstand 1 & 2 Lines to Pumphouse Filters	2,366	0.10	0.01	11/04/2008	PASS
4	Low- Sulfur Diesel Truck Line	53	0.10	0.05	11/05/2008	PASS
5	MOGAS Truck Line	53	0.10	0.07	11/05/2008	PASS

Table 2: HCNA LDS Tightness Test Results

SECTION No.	DESIGNATION	Section Volume [gal]	TEST DATE	TEST RESULT
1	Bio Diesel Truck Line	53	11/06/2008	Within Leak Threshold
2	Tank 22 & 23 16" Lines with Pumphouse	27,108	11/10/2008	Within Leak Threshold
3	Fillstand 1 & 2 Lines to Pumphouse Filters	2,366	11/05/2008	Within Leak Threshold
4	Low- Sulfur Diesel Truck Line	53	11/05/2008	Within Leak Threshold
5	MOGAS Truck Line	53	11/06/2008	Within Leak Threshold

Table 3: HCNA Stress with Integrity Test Results

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#### 5.2 <u>Problems Encountered</u>

General comment on Pipeline Integrity Assessment (Stress) Testing: The piping configurations for both the JP-8 and Ground Products lines include major above-ground portions in each test section. In the Tank 22 & 23 Issue/Receipt lines (Test Section 2), over 75% of the 2,879 If of piping is above-ground. In the Ground Product lines (Test Sections 1, 4, & 5), approximately 50% of the test section segments are above-ground. Given the test section configurations, and dependent upon start/stop times, the four hour stress/integrity tests experienced thermal induced gains and/or losses in static pressure. The test pressures were adjusted as required during testing to stress the test segment piping at a level of at least 150% of normal operating pressures, (i.e. 150 psi for the JP-8 lines and 60 psi for the ground product lines).

The initial Tightness Testing attempts on the Tank 23 16" Issue/Receipt line to PH-2221 were unsuccessful due to a leak-by condition at the PH-2221 16" and 10" Lubricated Plug Valves (#'s 11 & 21). It was evident the valves were not tight by the increase in pressures observed downstream during the initial test attempts. Even after these valves were properly lubricated the leak-by condition was still evident, therefore, the entire Tank 23 & 22 Issue/Receipt lines had to be tested as one combined section. This required the PH valves to be configured to allow crossover pressurization/depressurization with only the three fuelling pumps isolated out of the test segment.

#### 6 RECOMMENDATIONS

According to the information provided by the site, there is currently a Military Construction (Milcon) project in progress that will replace the existing fuelling system with a new Type III PH and Hydrant System at Kirtland AFB. There is no definite time schedule for the actual construction phase of the new project, therefore, we recommend as a minimum interim fix the replacement of the 16" and 10" PH valves required to isolate the tank issue/receipt lines. This will assist with the isolation and testing of the Tank 22 and 23 Issue/Receipt lines as individual test sections without pressurizing the entire PH, therefore improving the HCNA MDLR.

We commend the site for their proactive approach with the state environmental regulators as evidenced by the invitation offered to and accepted by Mr Baird Swanson of the New Mexico Environmental Department to be present and witness the testing conducted by HCNA. This interaction between all parties contributed to a better understanding of the HCNA technological capabilities as well as provided first hand knowledge on infrastructure deficiencies that required operational work-arounds in order to provide final certification of "tight" Kirtland AFB fuelling systems.

#### 7 HCNA Technology Approvals

The HCNA Leak Detection System technology utilized for this project at Kirtland AFB, New Mexico have been recognized and approved by the following authorities:

- <u>U.S. EPA Third Party Certification:</u> Ken Wilcox Associates Evaluation of the Hansa Consult of North America, LLC Pipeline Leak Detection System, Version 2.0—Final Report. December 15, 2005
- <u>Listing by the National Work Group on Leak Detection Evaluations (NWGLDE):</u> for Pipeline Leak Detection Applications: HCNA Pressure Step Leak Detection System Listing.

HCNA Pipeline Leak Detection System Version 2.0 Approval Letter, Issue Date March 7, 2006.

HCNA Mobile Trailer Pipeline Testing
Site: Kirtland AFB, New Mexico
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Appendix A

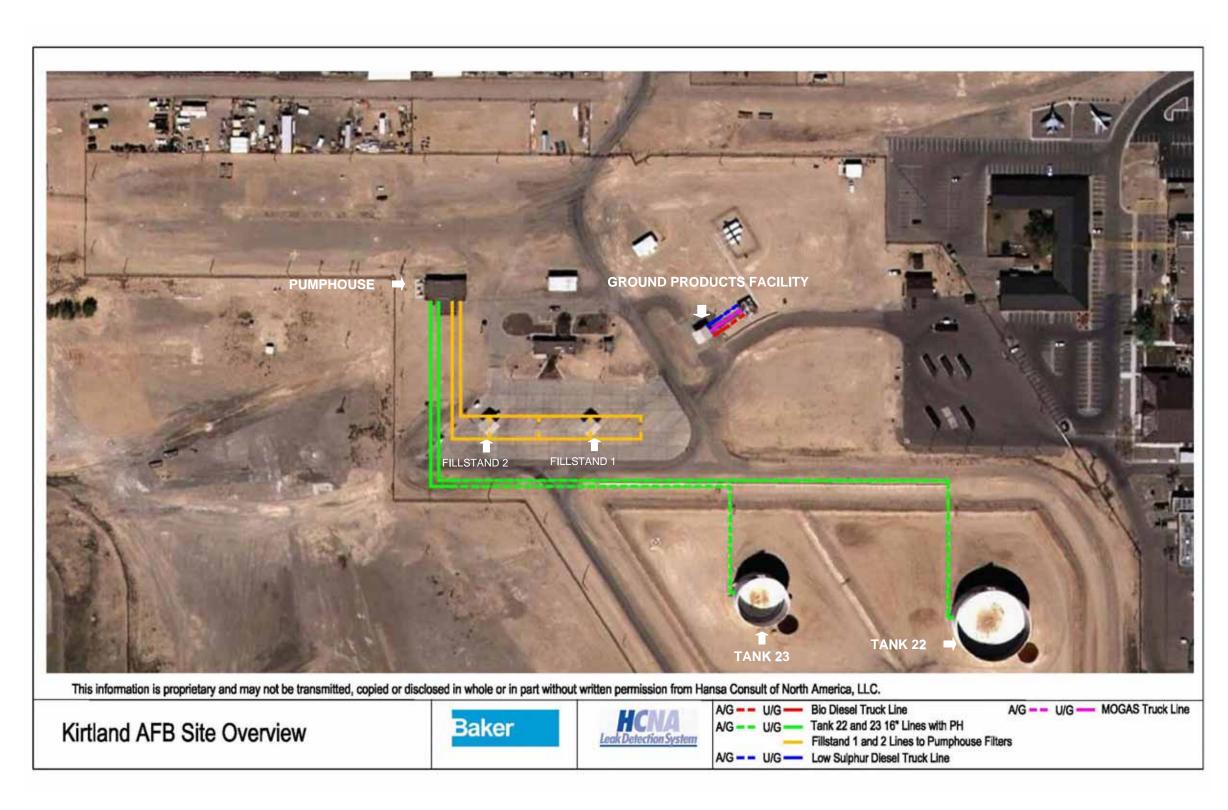
Appendix A: Test Section(s) Photographs

Site: Kirtland AFB, New Mexico
DESC Environmental Leak Detection Maintenance Program



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#### Site Overview:





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#### Photographs Test Section 1: Bio Diesel Truck Line



Figure 11: Ground Product Pumphouse Valves



Figure 13: "Typical" Ground Products Test Connection Point Configuration



Figure 12: Temporary Skillet



Figure 14: "Ground Product's" Pumphouse Facility

#### Photographs Test Section 2: Tank 22 & 23 16" Lines with Pumphouse



Figure 15: Bulk Tanks 22&23



Figure 16: Bulk Tanks 22&23 Above Ground Piping



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Figure 17: Tank Valves Tank 23



Figure 19: Pumphouse Facility 2221



Figure 21: Pumphouse Facility 2221 – "Plug Valves" I



Figure 18: Tank Valves Tank 22

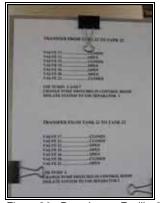


Figure 20: Pumphouse Facility 2221 Checklist



Figure 22: Pumphouse Facility 2221 – "Plug Valves" II

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Figure 23: "Typical" Pump Valve Configuration



Figure 24: "Typical" Pump Suction Header



Figure 25: Hose connection at filter separator



Figure 26: Trailer Test Connection Point - Section 2

#### Photographs Test Section 3: Fillstand 1 & 2 Lines to Pumphouse Filters



Figure 27: Fillstand Valve Configuration I



Figure 28: Fillstand Valve Configuration II



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Figure 29: Fillstand pressure relief connection



Figure 30: Trailer Hose Connection

#### Photographs Test Section 4: Low- Sulfur Diesel Truck Line



Figure 31: Ground Product Pumphouse Valves



Figure 32: Temporary Skillet



Figure 33: "Typical" Ground Products Test Connection Point Configuration



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#### Appendix B

#### **Photographs Test Section 5: MOGAS Truck Line**



Figure 34: Ground Product Pumphouse Valves



Figure 35: Temporary Skillet



Figure 36: "Typical" Ground Products Test Connection Point Configuration

# HCNA Mobile Trailer Pipeline Testing Site: Kirtland AFB, New Mexico DESC Environmental Leak Detection Maintenance Program



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Appendix B

**Appendix B: Trip Report** 

#### **HCNA Mobile Trailer Pipeline Testing**

Site: Kirtland AFB, New Mexico
DESC Environmental Leak Detection Maintenance Program



November 30, 2008

#### HCNA Project 2008-250

Appendix B

HCNA Charge Number	2008-250	Contract Number:	DESC Environmental Leak Detection Maintenance Program			
		Delivery Order	114623 8.7.9.33 Mod 1			
Date of Service	November 1-7, 10-11, 2008	HCNA Representative(s):	Harry Carter, Skip Phelps, Michael Sherlock, Steve Voce, and Daryl Vorderbruggen			
Location	Kirtland AFB, New Mexico					
Primary Contact	Telephone		Email:			
Mr. Marty Flack	Phone: (520) 990	) 9047	mflack@mbakercorp.com			
Site Contact	Telephone		Email:			
Mr. Mark Holmes - CES	Phone: (505) 846-9	9005	Mark.holmes@kirtland.af.mil			
		TRIP REPORT				
Specific Comments – Ite	ems of Interest					
See specific events and accomplishments by day.						
		-				
			-			

# HCNA Mobile Trailer Pipeline Testing Site: Kirtland AFB, New Mexico DESC Environmental Leak Detection Maintenance Program



November 30, 2008

#### HCNA Project 2008-250

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Subject: HCNA Mobile Trailer Pipeline Testing, Kirtland AFB, New Mexico

Reference: Trip Report

HCNA Representatives(s): Harry Carter, Skip Phelps, Michael Sherlock, Steve Voce, and Daryl

Vorderbruggen

Enclosed is the trip report for mobile testing for the period of November 1-7, 10-11, 2008. If you require any additional information please do not hesitate to contact me at your convenience.

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#### November 1-2 2008:

HCNA engineer mobilized personnel and equipment to Albuquerque, New Mexico.

#### Monday, November 3<sup>rd</sup> 2008:

HCNA personnel arrived on-site and meet with Marty Flack (Baker), and traveled out to Kirtland AFB. We gained access to the base through the Contractor's gate. This process took over an hour. We went to the Bulk Storage complex and made contact with the POL and LFM folks. We also met with the QAR for the contractor of bulk storage. We were given permission to begin setting up for testing of the Bio-Diesel Fuel line. We were asked to test this line first due to receiving of said product on 11/04. We positioned trailer just outside of pump house and began building a manifold. Additional HCNA engineers arrived at approximately 1300 and proceeded to CES Environmental, building and meet with Mr. Mark Holmes, to provide an overview of HCNA testing methodology as well as review specific Kirtland AFB testing activities. During this time HCNA personnel Installed pressure transmitter on manifold and primed the hand pump to begin pressurizing the BDF line. We bled air off the line out at the fill stand area. We determined the gate valves were bleeding by and so we will need to install skillets. We made arrangements to install skillets on all three ground product lines on 11/04/08. Following meeting we then proceeded to the fuel storage area and meet with current contract employees of Chugach Management Services and began to review piping configuration. Following review it was determined we would begin testing in the morning due to the onset of darkness. The trailer remained onsite adjacent to the truck rack and at 1700 HCNA engineers departed for the hotel.

#### Tuesday, November 4th 2008:

HCNA engineers arrived on-site at approximately 0730 and proceeded to storage area. We began installing skillet on the BDF line. Additionally, HCNA personnel positioned the trailer at a low-point associated with Tank 23 issue/receipt lines inside of the dike containment associated with both tank 22&23 to begin testing the JP8 tank lines. We attempted testing this test section with unsatisfactory results using the current valve configuration. It appears that valves were bleeding by and therefore we relocated to test the truck fill stand lines. Made connection at the pressure relief on the fill stand and configured the pump house to test both fill stands as one section. Once the trailer was connected we commenced with testing of Section 3 -Fillstand 1 & 2 Lines to Pumphouse Filters. We were able to run several tests, obtaining good results. Once completed test section connection was depressurized and disconnected and the area was policed for trash and used absorbents were disposed of in designated containers. All valves where returned to their original positions. During testing HCNA installed skillets on the gasoline (MUR) and the low-Sulfur diesel lines. HCNA completed skillet installation and began working on testing the JP-8 tank lines. The trailer was relocated near the filter separator at pumphouse facility 2221. We properly configured the pumphouse and connected the trailer. Once the trailer was connected we commenced with testing of Section 2 -Tank 22 & 23 16" Lines with Pumphouse. We were able to run several tests, obtaining good results. Once completed test section connection was depressurized and disconnected and the area was policed for trash and used absorbents were disposed of in designated containers. All valves where returned to their original positions. The trailer remained in the position and we coordinated to return this evening to conduct a four (4) hour stress/integrity assessment of the piping. HCNA returned to site at 2000 and commenced with testing, finally completed testing at 0600 on November 5<sup>th</sup>, the test trailer was shut down and stowed.

**DESC Environmental Leak Detection Maintenance Program** November 30, 2008 HCNA Project 2008-250

#### Wednesday, November 5<sup>th</sup> 2008:

HCNA engineers arrived on-site at approximately 0700 and proceeded to storage area. Upon arrival completed testing manifold for BDF line. Once completed the trailer, HCNA pressure transmitter, and HCNA portable pump were connected to the test section. Once this was complete we commenced with testing of Section 1 - Bio Diesel Truck Line. During testing additional test connection points were completed for the low-Sulfur diesel and MOGAS pipelines. We were able to run several tests, obtaining good results. Once completed test section connection was depressurized and disconnected. All valves were returned to their original positions. Again, trailer, HCNA pressure transmitter, and HCNA portable pump were connected to the test section. Once this was complete we commenced with testing of Section 4 - Low- Sulfur Diesel Truck Line. We were able to run several tests, obtaining good results. Once completed test section connection was depressurized and disconnected. All valves were returned to their original positions. HCNA testing equipment was then moved to and connected to Section 5 - MOGAS Truck Line. Once completed test section connection was depressurized and disconnected. All valves were returned to their original positions. Once completed with testing of all three ground product lines. The area was policed for trash and used absorbents were disposed of in designated containers. The test trailer was moved over to the fill stand lines to conduct a four (4) hour stress/integrity assessment of the piping. We completed the test at approximately 1730, system was then turned back over to base personnel and trailer was relocated back to conduct a four (4) hour stress/integrity assessment of the MOGAS piping. Completed testing at approximately 0100 on November 6<sup>th</sup>, once completed test section connection was depressurized and disconnected. All valves were returned to their original positions. Once completed with testing of all three ground product lines. The area was policed for trash and used absorbents were disposed of in designated containers. The test trailer was stowed and HCNA engineers departed for the hotel.

#### Thursday, November 6<sup>th</sup> 2008:

HCNA engineers arrived on-site at approximately 0630 and proceeded to storage area. Upon arrival began disassembling testing manifold for from the MOGAS line and purged the pump, hoses and the manifold with Bio Diesel in preparations to conduct a four (4) hour stress/integrity assessment of the test the bio diesel line. Began testing at approximately 0800 and testing completed at 1230. HCNA removed skillet from MOGAS line and reinstalled the pressure reliefs inside the pump house and the fill stand. Removed the manifold from the bio-diesel line and moved it over to the low-Sulfur line. HCNA began pressurizing and bleeding air on the line in preparations to conduct a four (4) hour stress/integrity assessment of the test the low-Sulfur diesel line. Began testing at approximately 1245 and testing completed at 1645. Removed skillet from diesel line, reconnected pressure relief's inside pump house and on fill stand and disassembled test manifold and reinstalled pressure transmitter in HCNA trailer. Cleaned up site and pump house and parked trailer next to building 1041 and departed site.

#### Friday, November 7<sup>th</sup> 2008:

HCNA engineers travel to home duty locations. The HCNA mobile test equipment will be retrieved next week and mobilized to a future site.

HANSACONSULT

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### HCNA Project 2008-250

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## Monday, November 10<sup>th</sup> 2008:

HCNA engineer mobilized to Albuquerque, New Mexico.

### Tuesday, November 11th 2008:

HCNA engineers arrived on-site at approximately 0730 and proceeded to storage area. The trailer was relocated near the filter separator at pumphouse facility 2221. We properly configured the pumphouse and connected the trailer. Once the trailer was connected we commenced with a four (4) hour stress/integrity assessment of the piping. Began testing at approximately 0830 and testing completed at 1230. Once completed test section connection was depressurized and disconnected and the area was policed for trash and used absorbents were disposed of in designated containers. All valves where returned to their original positions. We provided an out brief to base personnel. Following this HCNA staff mobilized from site to Albuquerque Airport as well as HCNA 2007 Chevy Silverado and HCNA test trailer traveled to home duty locations.

HCNA would like to express our gratitude for the support of Mr. Jim Cwikla and his LFM/POL base personnel (Paul, James, Nate).



November 30, 2008

HCNA Project 2008-250

Appendix C

**Appendix C: Test Certification Reports** 

Site: Kirtland AFB, New Mexico

**DESC Environmental Leak Detection Maintenance Program** 



November 30, 2008

### HCNA Project 2008-250





200 International Drive Bldg. 120 Portsmouth, NH 03801 Tel +1 - 603 - 422 8833 Fax +1 - 603 - 422 8865 E-Mail info@hcna-llc.com www.hcna-llc.com

#### HCNA Leak Detection System

#### Leak Detection Certification

Location: Kirtland AFB, New Mexico Date: November 21, 2008

Customer: Michael Baker Jr., Inc. Project No.: 2008 250

Project: HCNA Mobile Trailer Pipeline Testing
DESC Environmental Leak Detection Maintenance Program

#### General Pipeline Configuration Data:

SECTION		PIPELINE	PIPELINE	PIPELINE PIPELINE LENGTH [ft]					TOTAL		
No.	DESIGNATION	MATERIAL	SCHEDULE	4"	6"	8"	10"	12"	16"	24"	LENGTH [ft]
1	Bio Diesel Truck Line	cs	STD	80							80
2	Tank 22 & 23 16" Lines with Pumphouse Fillstand 1 & 2	cs	STD		80		200		2,479	120	2,879
3	Lines to Pumphouse Filters	cs	STD	100		885					965
4	Low- Sulphur Diesel Truck Line	CS	STD	80							80
5	MOGAS Truck Line	cs	STD	80							80
	TOTAL:			340	80	885	200	0	2,479	120	4,104

Table 1: General Pipeline Configuration Data Of Tested Fuel System @ Kirtland AFB, New Mexico

#### Legend:

SS: Stainless Steel CS: Carbon Steel STD: Standard Schedule

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\_\_Wirtland AFB Certification 1105.docx

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Site: Kirtland AFB, New Mexico

**DESC Environmental Leak Detection Maintenance Program** 



November 30, 2008

### HCNA Project 2008-250





200 International Drive Bldg. 120 Portsmouth, NH 03801 Tel +1 - 603 - 422 8833 Fax +1 - 603 - 422 8865 E-Mail info@hcna-llc.com www.hcna-llc.com



### **Leak Detection Certification**

#### Certification Test Data:

SECTION No.	DESIGNATION	TOTAL LENGTH [ft]	SECTION VOLUME [gal]	CERTIFIED MDLR [gal/h]	RECORDED LEAK RATE [gal/h]	TEST DATE	RESULT
1	Bio Diesel Truck Line	80	53	0.10	0.01	11/05/2008	PASS
2	Tank 22 & 23 16" Lines with Pumphouse	2,879	27,108	0.54	0.30	11/04/2008	PASS
3	Fillstand 1 & 2 Lines to Pumphouse Filters	985	2,366	0.10	0.01	11/04/2008	PASS
4	Low- Sulphur Diesel Truck Line	80	53	0.10	0.05	11/05/2008	PASS
5	MOGAS Truck Line	80	53	0.10	0.07	11/05/2008	PASS

Table 2: Leak Detection Sections Of Tested Fuel System @ Kirtland AFB, New Mexico

#### RESULT CRITERIA:

PASS: Test results were within the stated tolerance threshold.

FAIL: Test results were not within the stated tolerance threshold.

Hansa Consult of North America, LLC (HCNA) certifies that the piping listed in the above table has been tested by means of the HCNA Leak Detection System, which meets the criteria set forth in U.S. EPA/530/UST-90/010 for precision leak test.

HCNA certifies that this piping was tested on the date(s) and with the result(s) stated in the above table and as per attached test protocols.

According to EPA's Standard Test Procedures for Evaluating Leak Detection Methods: Pipeline Leak Detection Systems, the HCNA Leak Detection System method is capable of detecting leaks of 0.002% of line capacity with a probability of detection (P<sub>D</sub>) of 95% and a probability of false alarm (P<sub>FA</sub>) of 5%, as per Ken Wilcox Associates, Inc. Third Party Certification dated December 15, 2005.

Portsmouth, NH, November 21, 2008

Principal

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....Wirland AFB Certification 1108.docx

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Site: Kirtland AFB, New Mexico
DESC Environmental Leak Detection Maintenance Program



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Appendix C

	Pressure Test	Worksheet	HANSACONSULT
Location:	Kirtland AFB	Date:	November 10, 2008
Segment Name:	Tanks 22 & 23 (16" Line) w/PH	Delivery Order:	114623 8.7.1.9.33 Mod 1
		HCNA Project Number:	2008-250

	Segment Pipe Specification								
	Nominal	w.t.		Length (ft)		Volume	Project Engineer		
Pipe Segment	Dia. (in.)	(in.)	Buried	Exposed	Total	(gal)	Walter Phelps		
1	6	0.28	0	80	80	120	Test Engineer  Michael Sherlock, Harry Carter, and Daryl Vordurbrugger		
	10	0.365	0	200	200	819	Michael Shellock, Harry Carter, and Daryr Vordurbrugger		
	16 0.375			1,813	2,479	23,522	Software Test Engineer		
	24	0.375	0	120	120	2,647			
				Totals	2,879	27,108			
Equipment			Man	ufacturer/M	lodel				
Pressure Recorder			Rosemount	3051S					
Data Interface	HCNA LDS Version 2.0								
Automated Pressure Test Equipme	HCNA Mobile Trailer M2000								
Mechanical Equipment			N/A						

			Test Data	
Time	Transmitter Pressure - HCNA M2000 (psig)	Ambient Air Temp (°F)	Remarks (weather conditions or test activities)	)
9:30 AM	150.5	40	Start Test	
9:45 AM	148.619	40	NNW 5.1 mph- Inspect fittings	
10:00 AM	147.557	40.6		
10:15 AM	147.206	41	SW 1.2 mph	
10:30 AM	146.899	41	SSW 12.1 mph- Inspect fittings	
10:45 AM	147.115	41.5		
11:00 AM	147.766	42	WSW 6.3 mph	
11:15 AM	149.286	43		
11:30 AM	151.482	44		
11:45 AM	155.174	44.5	WSW 3.8 mph, - Inspect fitting	
12:00 PM	159.651	45		
12:15 PM	164.335	46		
12:30 PM	167.621	48		
12:45 PM	169.808	49	North 1.2 mph	
1:00 PM	173.51	49		
1:15 PM	175.222	50		
1:30 PM	177.406	51	WSW 11.2 mph, Mostly Cloudy - End T	est
	Notes/Comments			

Site: Kirtland AFB, New Mexico
DESC Environmental Leak Detection Maintenance Program



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Appendix C

	Pressure <sup>-</sup>	Test Worksheet	HANSACONSULT
Location:	Kirtland AFB	Date:	November 5, 2008
Segment Name:	Fillstand 1& 2	Delivery Order:	114623 8.7.1.9.33 Mod 1
		HCNA Project Number:	2008-250

	Segment Pipe Specification								
	Nominal	w.t.		Length (ft)		Volume	Project Engineer		
Pipe Segment	Dia. (in.)	(in.)	Buried	Exposed	Total	(gal)	Walter Phelps		
2	4	0.237	0	80	80	65	Test Engineer		
	8	0.322	775	110	885	2,301	Michael Sherlock and Harry Carter		
							Software Test Engineer		
				Totals	965	2,366	1		
Equipment			Man	ufacturer/N	lodel				
Pressure Recorder			Rosemount	3051S					
Data Interface	HCNA LDS Version 2.0								
Automated Pressure Test Equipment			HCNA Mobile Trailer M2000						
Mechanical Equipment			N/A						

			Test Data	
Time	Transmitter Pressure - HCNA M2000 (psig)	Ambient Air Temp (°F)		Remarks (weather conditions or test activities)
2:00 PM	152.809	48		Start Test
2:15 PM	151.893	48		SW 4.6 mph- Inspect fittings
2:30 PM	151.399	47		
2:45 PM	150.15	46		NNW 17.5 mph
3:00 PM	149.222	45		W 10.4 mph
3:15 PM	147.974	45		NNW 5.0 mph
3:30 PM	147.258	45		6.0 ph winds
3:45 PM	146.274	44		SW 16 mph, Clear
4:00 PM	145.066	43.5		W 10.4 mph - Inspect fittings
4:15 PM	143.876	43.5		
4:30 PM	141.759	43		NNE 13.4 mph - Inspect fittings
4:45 PM	138.243	42.5		
5:00 PM	134.182	42		NW 17.3 mph - Inspect fittings
5:15 PM	128.873	41.5		
5:30 PM	124.046	41		
5:45 PM	119.8	40.5		
6:00 PM	116.168	39		NW 15.4 mph, Mostly Cloudy - End Test
A 1 1'4' 1 1	lotes/Comments			

Additional Notes/Comments:

Site: Kirtland AFB, New Mexico

**DESC Environmental Leak Detection Maintenance Program** 



November 30, 2008

### HCNA Project 2008-250

Appendix C

	Pressure Te	st Worksheet	HANSACONSULT
Location:	Kirtland AFB	Date:	November 6, 2008
Segment Name:	Bio-Diesel Truck Line	Delivery Order:	114623 8.7.1.9.33 Mod 1
	_	HCNA Project Number:	2008-250

	Segment Pipe Specification							
	Nominal	w.t.		Length (ft)			Project Engineer	
Pipe Segment	Dia. (in.)	(in.)	Buried	Exposed	Total	(gal)	Walter Phelps	
3	4	0.237	35	45	80	53	Test Engineer	
							Harry Carter	
							Software Test Engineer	
				Totals	80	53	1	
Equipment	•	-	Man	ufacturer/M	odel			
Pressure Recorder			Rosemount	3051S				
Data Interface			HCNA LDS Version 2.0					
Automated Pressure Test Equipm	HCNA Mobile Trailer M2000							
Mechanical Equipment			Baker SPD Pump H54001					

			Test Data
<del></del> .	Transmitter Pressure - HCNA	Ambient Air	Remarks
Time	M2000 (psig)	Temp (°F)	(weather conditions or test activities)
8:15 AM	69.252	27.7	Start Test
8:30 AM	75.461	29.1	Calm, Clear - Inspect fittings
8:45 AM	84.726	30.2	Variable, Clear
9:00 AM	95.878	31.3	Light Winds
9:15 AM	111.383	32.5	Variable 3.5 mph, Clear
9:30 AM	83.219	33.8	SW 11.5 mph, Clear - Inspect fittings
9:45 AM	89.37	35.1	
10:00 AM	103.133	36.5	SW 16 mph, Clear
10:15 AM	117.096	37.2	SW 16.5 mph, Cloudy - Inspect fittings
10:30 AM	73.127	38.1	
10:45 AM	81.025	38.5	
11:00 AM	98.058	39	
11:15 AM	112.689	39.7	SW 16 mph, Cloudy
11:30 AM	128.05	40.3	SW 16 mph, Cloudy
11:45 AM	81.025	40.6	
12:00 PM	90.503	41.4	
12:15 PM	102.073	42.1	Winds 16 mph, Mostly Cloudy - End Test

Additional Notes/Comments:

For the Bio Diesel Test Section, approximately 200 ml of product was extracted after each hours test duration to maintain the desired stress pressures. The Bio Diesel test was conducted between 0800 and 1200 during a thermal warming cycle.

Site: Kirtland AFB, New Mexico
DESC Environmental Leak Detection Maintenance Program



November 30, 2008

# HCNA Project 2008-250

Appendix C

	Pressure Te	st Worksheet	HANSACONSULT
Location:	Kirtland AFB	Date:	November 6, 2008
Segment Name:	Low-Sulfur Truck Line	Delivery Order:	114623 8.7.1.9.33 Mod 1
		HCNA Project Number:	2008-250

Segment Pipe Specification							HCNA Representatives
	Nominal	w.t.	Length (ft)			Volume	Project Engineer
Pipe Segment	Dia. (in.)	(in.)	Buried	Exposed	Total	(gal)	Walter Phelps
4	4	0.237	35	45	80	53	Test Engineer
							Michael Sherlock and Harry Carter
							Software Test Engineer
				Totals	80	53	
Equipment			Manufacturer/Model				
Pressure Recorder			Rosemount 3051S				
Data Interface			HCNA LDS Version 2.0				
Automated Pressure Test Equipment			HCNA Mobile Trailer M2000				
Mechanical Equipment			Baker SPD Pump H54001				

Test Data						
Time	Transmitter Pressure - HCNA M2000 (psig)	Ambient Air Temp (°F)		Remarks (weather conditions or test activities)		
12:15 PM	80.413	42.1		Start Test		
12:30 PM	77.816	43		Calm, Clear - Inspect fittings		
12:45 PM	75.031	43.5		Variable, Clear		
1:00 PM	75.835	44.1		Light Winds		
1:15 PM	76.954	44.1		Variable 3.5 mph, Clear		
1:30 PM	76.953	44.8		SW 11.5 mph, Clear - Inspect fittings		
1:45 PM	76.927	45.3				
2:00 PM	76.524	45.3		SW 16 mph, Clear		
2:15 PM	76.721	44.6		SW 16.5 mph, Cloudy - Inspect fittings		
2:30 PM	76.617	44.4				
2:45 PM	74.244	44.8				
3:00 PM	71.184	44.6				
3:15 PM	68.154	44.4		SW 16 mph, Cloudy		
3:30 PM	63.562	44.1		SW 16 mph, Cloudy		
3:45 PM	58.461	44.1				
4:00 PM	54.234	44.1				
4:15 PM	50.505	44.1		Winds 16 mph, Mostly Cloudy - End Test		
	_					
Additional I	Notes/Comments	:				

Site: Kirtland AFB, New Mexico

**DESC Environmental Leak Detection Maintenance Program** 



November 30, 2008

### HCNA Project 2008-250

Appendix C

	Pressure Te	est Worksheet	HANSACONSULT
Location:	Kirtland AFB	Date:	November 5, 2008
Segment Name:	MOGAS Truck Line	Delivery Order:	114623 8.7.1.9.33 Mod 1
		HCNA Project Number:	2008-250

Segment Pipe Specification							HCNA Representatives
	Nominal	w.t.	Length (ft)		Volume	Project Engineer	
Pipe Segment	Dia. (in.)	(in.)	Buried	Exposed	Total	(gal)	Walter Phelps
5	4	0.237	35	45	80	53	Test Engineer
							Michael Sherlock and Harry Carter
							Software Test Engineer
							1
				Totals	80	53	1
Equipment	Manufacturer/Model						
Pressure Recorder	Rosemount 3051S						
Data Interface	HCNA LDS Version 2.0						
Automated Pressure Test Equipme	HCNA Mobile Trailer M2000						
Mechanical Equipment	Baker SPD Pump H54001						

Test Data						
Time	Transmitter Pressure - HCNA M2000 (psig)	Ambient Air Temp (°F)		Remarks (weather conditions or test activities)		
8:15 PM	61.092	41		Start Test		
8:30 AM	45.71	41		WNW 3.6 mph Clear - Inspect fittings		
8:45 PM	31.2	41				
9:00 AM	65.16	40		Light Winds		
9:15 PM	56.335	40		Variable 3.5 mph, Clear		
9:30 AM	49.143	40.5		Calm		
9:45 PM	41.719	43		Calm		
10:00 AM	59.332	46		Calm		
10:15 PM	62.428	45		Variable W 3.5 mph, Clear		
10:30 AM	53.441	45		South 5.8 mph		
10:45 PM	42.319	46		WSW 12.7 mph, Cloudy		
11:00 AM	66.588	47		WSW 21.0 mph, Cloudy		
11:15 PM	56.965	48		WSW 12.1 mph, Cloudy		
11:30 AM	42.473	50		Variable WNW 1.3 mph, Clear		
11:45 PM	35.099	46		WNW 5.1 mph		
12:00 AM	28.256	46		WNW 8.1 mph		
12:15 AM	68.848	46		Winds WNW 21 mph, - End Test		
	·					

Additional Notes/Comments:

For the MOGAS Test Section 5, approximately 40 ml of product was added after each hours test duration to maintain the desired stress pressures. The MOGAS test was conducted between 2000 and 2400 during a thermal cooling cycle.

Site: Kirtland AFB, New Mexico

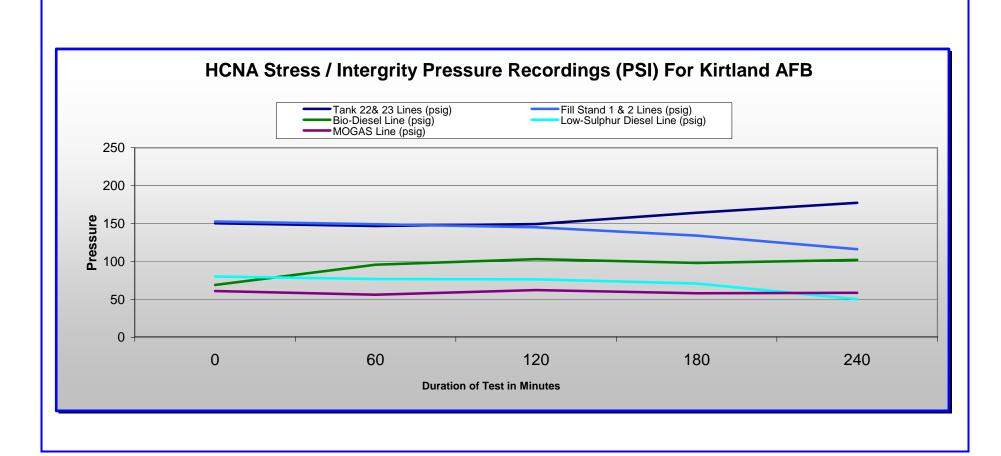
**DESC Environmental Leak Detection Maintenance Program** 



November 30, 2008 HCNA Project 2008-250 Appendix C

Hansa Consult North America (HCNA) LLC Pressure Test Results
Tests Conducted November 5,6, and 10 2008







November 30, 2008

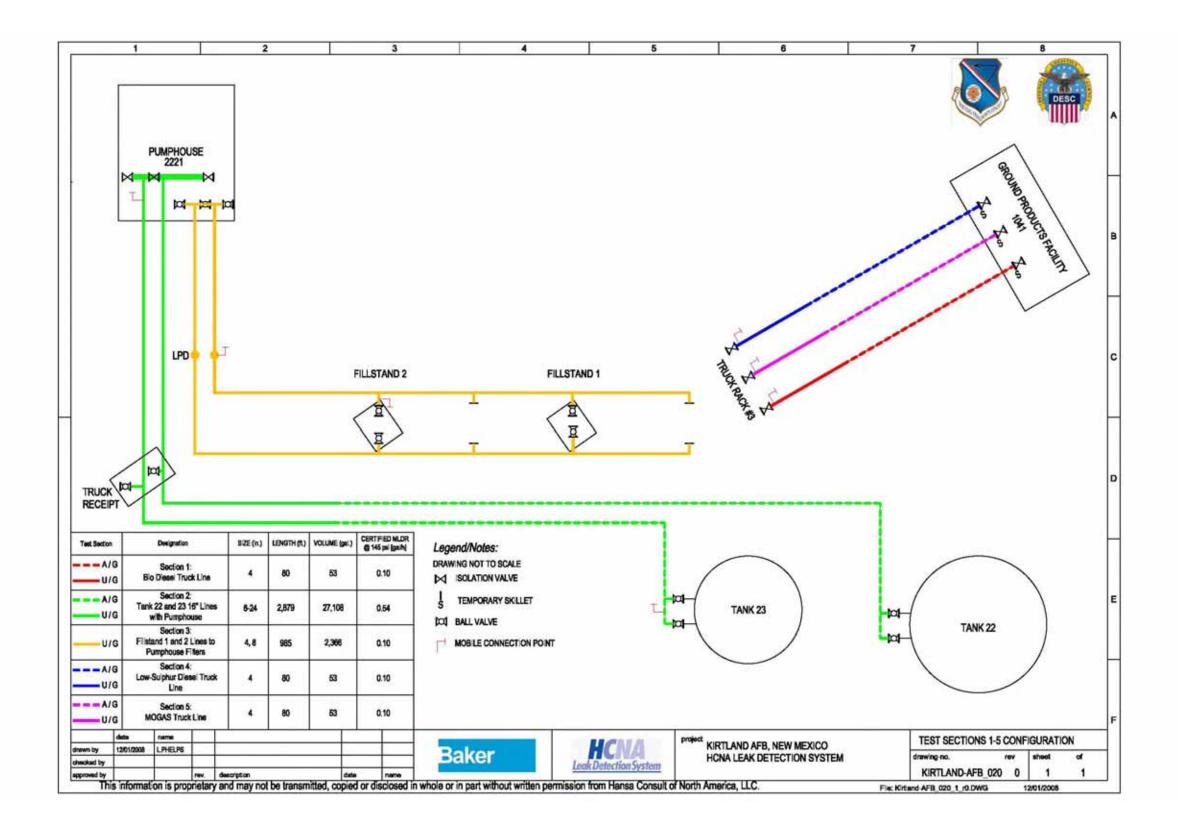
HCNA Project 2008-250

Appendix D

**Appendix D: Configuration Drawings** 



ber 30 2008 HCNA Project 2008-250





November 30, 2008

HCNA Project 2008-250

Hansa Consult of North America, LLC appreciates the opportunity to be of service to your organization. Because we are constantly striving to improve our service to you, we welcome any comments or suggestions you may have about how we can be more responsive to the needs of your organization. If you have any questions about the annual certification visit, analytical results, or this report, please give us a call at 1 888 MY HANSA.